



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415**

April 16, 2010

Mr. Michael Colomb
Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
185 Old Ferry Road
P.O. Box 500
Brattleboro, VT 05302-0500

**SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION PRELIMINARY RESULTS
OF INSPECTION RELATED TO VERMONT YANKEE GROUND WATER
PROGRAM AND RECENT ONSITE GROUND WATER CONTAMINATION**

Dear Mr. Colomb:

This letter documents the preliminary results of NRC's review and assessment of your implementation of the Nuclear Entergy Institute (NEI) 07-07, Ground Water Protection Initiative (GPI), and the inspection of your performance relative to the discovery of onsite groundwater contamination that was reported to the NRC on January 7, 2010. The inspection was conducted from January 25, 2010, through April 14, 2010, in accordance with NRC Temporary Instruction (TI) 2515/173, "Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative"; and NRC Inspection Procedure 71153, "Follow-up of Events and Notices of Enforcement Discretion."

The GPI program is a formal voluntary industry commitment to address the monitoring of groundwater at nuclear power plant facilities, with a goal to minimize the potential for groundwater contamination to adversely impact the environment. The objective of TI-2515/173 is to assess the groundwater protection programs to determine whether licensees have implemented the specifications of the voluntary industry groundwater protection initiative. The inspection at Vermont Yankee specific to TI-2515/173 and IP 71153 included a review of the recent groundwater contamination at Vermont Yankee to assess Entergy's performance relative to its investigation of the associated tritium leak and corrective actions.

Regarding the NRC review of your GPI program, the NRC determined that, as of the end of 2009, Entergy had completed certain essential elements of the voluntary GPI, including the establishment of three wells that were situated to detect contaminated groundwater that may flow to the Connecticut River. One of these wells, GZ-3, was instrumental in the identification of the tritium-contaminated groundwater in January 2010.

Although the previously installed monitoring wells were key in the identification of the recent groundwater contamination, some voluntary aspects of the GPI had not been completed within the timeframe specified by the industry initiative. These included enhancements of existing leak detection methods, enhancements to prevent spills or leaks from reaching the groundwater, preventive maintenance of equipment to minimize the potential release of radioactive material, and establishing a frequency for the review of structures, systems, and components, and work

practices. In addition, Entergy had not established a site-specific groundwater monitoring plan or revised its Final Safety Analysis Report to include the current characterization of hydrology and geology at the site. While the GPI contained voluntary elements relative to onsite groundwater monitoring, the NRC also verified the licensee's compliance with regulatory requirements related to effluent and environmental monitoring, including those related to documentation and reporting.

Relative to NRC's review in accordance with NRC Inspection Procedure 71153, "Follow-up of Events and Notices of Enforcement Discretion," the NRC confirmed that, upon indication of groundwater contamination in early January 2010, Entergy initiated immediate actions to review and assess the condition. By mid-February, Entergy identified and terminated the leak of tritiated water from an underground pipe vault associated with the Advanced Off-Gas (AOG) system. As of the completion of this NRC inspection, Entergy's root cause analysis (RCA) for this matter had not been completed. Upon Entergy's completion of its RCA, the NRC will review and assess the comprehensiveness of the RCA in a separate NRC inspection activity, and the results will be documented in a separate inspection report.

Relative to the impact of the AOG system leak on public health and safety, as well as its impact on the environment, the NRC, based on its inspection, determined that Entergy appropriately evaluated the contaminated groundwater with respect to off-site effluent release limits and the resulting radiological impact to public health and safety; and that Entergy complied with all applicable regulatory requirements and standards pertaining to radiological effluent monitoring, dose assessment, and radiological evaluation. Based on our reviews, we have concluded that no violations of NRC requirements were identified.

Specifically, the NRC independently confirmed that:

- Regarding the tritium contaminated groundwater condition, the public's health and safety, and the off-site environment were not adversely affected. To date, plant-related radioactivity, including tritium, has not been detected in any samples of water, river sediment, or fish collected from the Connecticut River; or in any drinking water wells, on- or off-site; and only tritium has been identified in any on-site groundwater monitoring well.
- The estimated dose to the maximum exposed member of the public due to potential groundwater migration to the adjacent Connecticut River is less than 0.01 millirem in a year, i.e., well below the established limits of: NRC's 100 millirem per year dose limit for individual members of the public [10 CFR Part 20.1301(a)], Environmental Protection Agency's (EPA) 25 millirem per year specification for an individual member of the public [10 CFR Part 20.1301(e)], and NRC's liquid effluent As Low As is Reasonably Achievable (ALARA) design criteria of 3 millirem per year [10 CFR Part 50, Appendix I].
- Regarding the soil contaminated with low levels of cesium-137, cobalt-60, zinc-65, and manganese-54 that was found in the immediate vicinity of the leakage from the AOG system pipe vault area, there is no radiological significance relative to public health and safety. Sampling indicated very limited migration in the immediate area, which is typical and expected for these radionuclides. Entergy took appropriate precautions to protect onsite workers and has initiated action to remove the contaminated soil and dispose of it in accordance with NRC regulatory requirements.


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3

As you aware, the NRC has established a Task Force [ADAMS Accession No. ML100640188] to re-evaluate the current practices and threshold for response to groundwater contamination incidents. Lessons-learned from Vermont Yankee will be incorporated into this initiative.

We expect to finalize and issue the associated inspection report (IR 05000271/2010006) in mid-May 2010. We are prepared to discuss the preliminary results included in this letter at the public open house and question and answer meeting scheduled for April 19, 2010, in Brattleboro, VT. If you have any questions in any of these matters, please contact Mr. John White of my staff at (610) 337-5114.

Sincerely,

A handwritten signature in black ink, appearing to read "DARRELL" followed by a flourish and the word "for".

Darrell J. Roberts, Director
Division of Reactor Safety

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Sincerely,
/RA/ Peter R. Wilson for:
Darrell J. Roberts, Director
Division of Reactor Safety

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